

Application No. 09/618,708

TRW Docket No. 36-0032

greater in length than the distance between the top of said semiconductor layer and said second surface, said optical data bus extending beyond both said semiconductor layer and said second surface with said first and second ends being positioned spaced from said semiconductor layer and from said second surface;

at least one device optically coupled to said optical data bus, said at least one device being external to and spaced from said wafer; and

Ad a node formed on said semiconductor layer adjacent to said optical transmission interface and a side of said optical data bus, said node having means for optically coupling said plurality of integrated circuits and said optical data bus through said side of said optical data bus for providing optical data communication with said at least one device.

2. (Amended) An integrated circuit device as recited in claim 1, wherein said optical data bus includes a plurality of couplers longitudinally spaced apart along said optical data bus, each of said couplers for translating incident optical energy propagating thereto in a direction normal to said optical data bus to optical energy propagating in opposite directions along the axis of said optical data bus and for translating the direction of propagation of a portion of incident optical energy propagating along said axis of said optical data bus to optical energy propagating in a direction normal to said axis and out said side of said optical data bus;

one of said plurality of couplers being positioned in alignment with said node on said wafer; and

at least one other of said plurality of couplers being optically coupled to said at least one device.

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3. (Amended) An integrated circuit device as recited in claim 2, wherein each of said couplers comprise a Bragg diffraction grating.

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4. (Amended) An integrated circuit device as recited in claim 2, wherein said at least one device comprises a plurality of devices, each of said devices being spaced from one another along said optical data bus, and wherein each of said plurality of said couplers of said optical data bus are positioned adjacent a respective one of said plurality of devices.

5. (Amended) An integrated circuit device as recited in claim 2, wherein said optical data bus comprises a slab of light transmissive dielectric material, said slab having a straight elongate geometry.

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37. (Amended) An integrated circuit device comprising:
a wafer having a first surface, and a second surface opposite said first surface;
a semiconductor layer disposed on said first wafer surface;
a plurality of integrated circuits formed on said semiconductor layer;
an optical data bus extending along an edge of said wafer normal to said first wafer surface, and extending beyond both said semiconductor layer and said second surface, said optical data bus having first and second ends and a side and being greater in length than the distance between the top of said semiconductor layer and said second surface;

said optical data bus being physically disconnected from said optical transmission interface and said wafer;

a plurality of external devices coupled to said optical data bus; and

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a node formed on said semiconductor layer adjacent to said wafer edge and a side of said optical data bus, said node including means for optically coupling said plurality of integrated circuits and said optical data bus;

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said optical data bus including a plurality of couplers longitudinally spaced apart along said optical data bus, each of said couplers for translating incident optical energy propagating thereto in a direction normal to said optical data bus to optical energy propagating in opposite directions along the axis of said optical data bus and for translating the direction of propagation of a portion of optical energy propagating along said axis of said optical data bus incident thereon to optical energy propagating in a direction normal to said axis out a side of said optical data bus;

one of said plurality of couplers being positioned in alignment with said node; and
the remainder of said plurality of couplers being optically coupled to respective ones of said plurality of external devices.

Please add the following new claims:

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41. (New) An integrated circuit device as recited in claim 3, wherein said at least one device comprises a plurality of devices, each of said devices being spaced from one another along said optical data bus, and wherein each of said plurality of said couplers of said optical data bus are positioned adjacent a respective one of said plurality of devices.

42. (New) An integrated circuit device as recited in claim 41, wherein said optical data bus comprises a slab of light transmissive dielectric material, said slab having a straight elongate geometry.
